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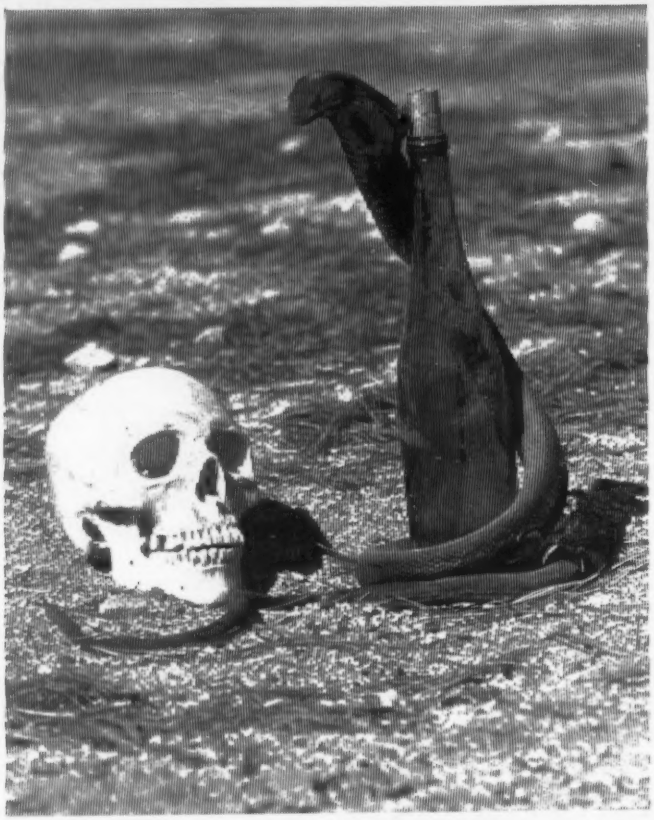
NOVEMBER
1984

NO-CUT Windshields

ARIZONA JONES and the BOTTLE OF DOOM

DRIVER



ARIZONA JONES

and the

BOTTLE OF DOOM

A TONGUE-IN-CHEEK DRINKING AND DRIVING FANTASY, WITH APOLOGIES TO GEORGE LUCAS, STEVE SPIELBERG AND HARRISON FORD

by JERI ROOD

PROLOGUE—

When Professor Arizona Jones turned from the small hole he was digging and saw the cobra, he nearly dropped the skull he had just found.

The snake was curled around an old glass bottle he had set aside, and its head was aimed directly at him. He felt his entire body tense as he prepared to move. He knew if he tried to jump back he'd never make it, so he edged away carefully until he was out of striking range.

Only then did he give in to trembling. He hated snakes. Ordinarily, he would have let the snake keep the bottle. It was just a plain glass bottle, like thousands of others he'd dug up since beginning his archaeological diggings in North America. But this one was different. It wasn't empty.

Consciously calming his hand, he drew a heavy revolver from a holster on his belt and aimed at the wide hood of the snake. The bullet ripped the snake's body off the bottle.

Professor Arizona Jones had competition for his archaeological find.

Jones retrieved the bottle, which fortunately was undamaged with the cork still jammed in the neck. Inside was a clear liquid. He hoped it would help solve the mystery of what had happened to this civilization.

CHAPTER ONE
Jones Hears the Theory of the Bottle

Jones took the latest of his finds back to his university and consulted the ranking authority on ancient North American cultures, Professor Abner Lindenwood, his old friend and mentor.

"Where did you say you found this, Ari?" asked Lindenwood.

"With the remains of an ancient automobile, like all those other bottles. But this is the first one I've found with anything in it."

"I've found several full containers, myself," Lindenwood said.

"Then do you know what the stuff is?" asked Jones.

"Yes, Ari. Your bottle, and the metal and glass containers I discovered, contain a flammable liquid that was called *alcohol.*"

"I've heard of that. Isn't it a liniment? I can't imagine why they all used that, unless the entire population was suffering from strained back muscles."

"Many of them did have bad knees from too much running, but that isn't what this was for. I have a theory, Ari. I believe those people used to *drink* alcohol."

"You're kidding. I thought it was poisonous."

"That's the common thinking today. But I think this is ethyl alcohol, or C_2H_5OH. Ethyl alcohol was made by fermentation of grains or fruit, making 'beer' or 'wine.' By distilling the liquids, these ancient people could make 'distilled spirits,' a considerably more powerful form of alcohol. These liquids shouldn't be poisonous."

" 'Shouldn't be'?" said Jones.

"Well, I haven't had the courage to test it," said Lindenwood. "That's why all my work is conjecture."

He went to a cluttered desk and showed Jones several untidy piles of notes and papers.

"This is my life's work, Ari, the results of all my research into ancient North American civilization. I'd be willing to share my findings with you, if you would help me prove my theories on this alcohol liquid. I warn you — a human test might be necessary. Unless you can locate the Well of Spirits."

"The what?"

"Some religious site, apparently. Tradition states that the key to the puzzle of ancient alcohol use is a manuscript found in a place called the Well of Spirits. It was supposed to be somewhere in North America. That narrows it down to several million square miles. I know of only one clue to its whereabouts."

Jones was doubtful about the existence of a "Well of Spirits," but he agreed to look into Lindenwood's theories, in exchange for half the credit. He asked for some examples.

"Well, this one, for instance," said Lindenwood, digging through the pile and locating a certain paper. "It says that the Americans, as I call them, drank alcohol to achieve stimulation and increased efficiency."

"If that's the case," said Jones, "then why do we find so many of those bottles and metal containers in automobiles that are smashed?"

"You'll have to find out if there's a connection," said Lindenwood, waving away his objection. "All this research is based on certain literature I've

continued

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arizona jones
continued

discovered. These were very widely-held beliefs of Americans. Like this one — 'The mark of a real man is how much he can drink.' Or this one . . ."

Jones spent several hours with Lindenwood, going over the various ideas the old professor had on the ancient Americans' use of alcohol. When he left with the papers and Lindenwood's full containers of alcohol, Jones was feeling uneasy. Lindenwood was the internationally recognized authority on ancient North America cultures, but Jones had doubts about his research on this subject.

Lindenwood's data suggested that alcohol was a harmless mood elevator, but Jones was disturbed by certain facts: Many of the ancient automobiles that were dug up had been smashed into other automobiles. Often there were human remains inside. And often, by some estimates as much as 50 percent of the time or more, there were containers of alcohol in the smashed automobiles. Maybe there was no connection, but Jones was beginning to have a feeling there was something sinister going on. The feeling was like a snake slithering up his back.

CHAPTER TWO
Jones Takes a Chance

The French archaeologist, Jones' bitterest rival, stood swaying beside the table, a half-empty bottle in his hand.

"You know what this alcohol is, don't you, Arizona?" he said. "It's a magical potion that helps you see God."

It was two months later. Jones had flown out to the archaeological site in the western part of the North American continent, looking for more clues on the location of the Well of Spirits. The best he had done so far was to find this sorry-looking individual at an inn, drinking up a find of enormous historical importance.

"There are better ways to see God, Rene," said Jones. "Sit down before you fall down."

The other man tried to sit, but missed the chair. Jones retrieved the bottle from his hand and left him snoring on the floor.

"Jack," he said later to his pilot, "I have the feeling old Professor Lindenwood is off the track in calling this stuff a stimulant. Rene looked more like he was on an anesthetic. We'll just have to test it out; there's no other way."

"Could be very dangerous," said Jack. "You go first."

Without a volunteer, Jones decided he would have to test out its effects on himself. After lunch he had his first glass of alcohol from the bottle he had found at the archaeological site. He discovered that the effects took a little time to appear, and a lot longer to go away.

Despite its burning taste, one glass of alcohol made him feel warmed and pleasant, but not much else. He wrote this in some notes for Prof. Lindenwood. He waited a while and had a second glass.

continued

The substance was a clear liquid with a strong odor. What was the significance of its location in a wrecked car with human remains?

Lindenwood's life's work centered around the ancient North American civilizations and their cultures. Alcohol usage was a favorite subject.

(right)
"Too bad you can't talk, Yorick, old friend. You might be able to explain this mystery to me."

"Warm, pleasant feeling increased," he wrote. "Also feeling very confident and less restrained."

Jack began to notice that Jones was getting careless and was becoming less aware of what was happening. After a third glass of alcohol, Jones decided to take the car out for a drive away from the digging site. Jack noticed he was having difficulty concentrating, and that he was inattentive to the driving, paying more attention to the bottle than to the road. When they stopped to let Jones write some more in his notes, he was easily distracted from the writing. He was getting impulsive as well, suggesting that he would like to ride on the running board.

Jack reluctantly took the wheel, and Jones rode along outside the car, shouting, until Jack braked and Jones fell off.

Jack took over writing the notes because Jones no longer cared about recording anything.

"Jones has fourth drink," he wrote. "I think his judgment is severely affected. He wants to drive, and I don't think he can handle the job. At the wheel, his movements are hesitant, making lots of mistakes.'

After a fifth drink, Jones was losing sensation. He hit his head on the windshield but didn't feel it. Jack wrote: "Seems to be losing control of small muscles."

"Holy smokes, Ari!" he said to Jones as they almost ran into some trees. "Watch it! You'd better let me take over." He made a mental note to write, if he survived Jones' driving, "Squinting; visual focus seems to be affected. Also depth perception and peripheral vision."

Suddenly Jones ran off the road and blew out a tire. Somehow they stopped upright and Jack got out to change to a spare. Jones had another drink, his sixth — although he had lost count and didn't care.

Jack told him to get in the rumble seat of the car. Jones protested, but finally got out from behind the wheel. When he tried to get in the rumble seat, he stumbled and fell. He was dragged from some distance, hanging onto the vehicle seat belt. Finally, his screaming got Jack's attention and they stopped.

"That's it for this experiment," said Jack decisively.

The next morning, Jones had a massive headache that would last until well into the afternoon. He had only foggy memories of events starting with the ride on the running board. He was inclined to disbelieve Jack's report, except for the cuts and bruises that he found all over his body. He felt embarrassed, but more than that, he felt in pain.

Using his and Jack's notes, and Jack's observations, he wrote to Prof. Lindenwood.

"Dear Abner: You wrote in your papers that the ancient Americans used alcohol as a stimulant. According to my experiments, they couldn't have. Strange as it may sound to you, I think alcohol is a general depressant of the entire central nervous system."

He gave all the details and concluded, "As I drank more of that stuff, I lost more and more mental faculties and physical abilities. I wouldn't be at all surprised if you could kill yourself if you drank enough alcohol. It seems to depress all physical functions — muscle control, coordination, consciousness, even breathing.

"The conclusion I draw is that it is not safe to drive a car when using alcohol. You gradually lose the ability even to hold your head up. But one of the first things you lose after drinking is your good judgment. Foolish, dangerous things seems more reasonable. You don't stop to consider the consequences of your actions.

"So I think I may understand why so many of the ancient automobiles were found with empty alcohol containers inside. If they tried driving after swallowing a lot of that stuff, it's no wonder they're all dead."

CHAPTER THREE
Jones Hatches a Scheme

Jones knew he needed some solid information, and he decided on a long shot. He recalled Lindenwood having mentioned a clue to the location of the Well of Spirits. This was a copy of part of the ancient manuscript, a fragment covered with numbers that he had entrusted to his daughter Marian. Jones traced her to a small inn in a remote town in the Himalayas.

He knew there was no chance to bargain with her when she greeted him with a right cross to the chin the moment he walked in the door. But he tried explaining anyway.

"It's a worthless old piece of paper, Marian," he said finally. "Are you going to give it to me?"

"I don't have it," she grinned at him.

Jones didn't believe her, and he formed a plan to get it away from her. He remembered some of Lindenwood's research: "Apparently, real men could consume more alcohol than women . . . The fermented drink called 'beer' was less intoxicating than the other forms of alcohol . . . Those who had more experience at drinking alcohol could 'hold their liquor' far better than those who did not . . ."

Jones reasoned that he had at least a little experience, and that he could outdrink a mere woman if he drank Lindenwood's metal cans of beer and she drank Rene's bottle of wine. After she had passed out, he would look for the parchment.

He convinced her this was an experiment for her father, and explained he was drinking the beer because it was a "man's drink." She called him a chauvinist.

"What is this stuff, anyway?" she said, looking at the bottle he had given her. "'Chateau Bellosh'?"

"An old family label, I think," he said, urging her to drink up.

Jones found that the beer did indeed seem to be a less potent drink than the other alcohol. So he tried to ease Marian's suspicions by drinking one can of beer to every glass of wine she drank. "Trust me," he said.

His strategy backfired, for when he thought she was unconscious and he began to search the inn, Marian called to him.

"I really don't have it. If you get me back home in style, I'll take you to it."

On their way to a city in the Far East, Jones mailed another letter to Lindenwood.

In it, he wrote, "I don't think there's that much difference in the way men

continued

(above)
Riding on a running board . . .

(right)
. . . Led to some serious problems for Jones when the car stopped too quickly.

and women handle alcohol, and I don't think there is that much difference between kinds of alcohol. I tried to outdrink a woman" — he didn't specify whom — "and it didn't work. Although I was drinking beer and she was drinking wine, we both became under the influence of the alcohol — a condition I have taken to calling 'drunk.'

"Beer is a more dilute solution of alcohol; that's about the only real difference. I had as many cans of beer as she had glasses of wine, and we were both staggering badly as we left the place."

He didn't mention that they left because they had accidentally set fire to Marian's inn.

"I think," his letter went on, "that the difference in tolerance for alcohol has nothing to do with being male or female. My theory is that it has to do with body weight. A larger person can drink more — I was in better condition than the woman, but because I am larger, not because I am a man. But believe me, I wasn't in much better condition.

"The alcohol will affect every person about the same way, I believe. It

will just take some people longer. The things I see that will help a person to delay the 'drunk' condition are food in the stomach, slower drinking rate, and kind of alcoholic beverage. Don't be fooled by that last one. I drank a supposedly less potent beverage, but I drank *more* because it didn't taste strong. I believe each of my cans of beer had as much pure alcohol as each glass of wine the woman drank."

Jones and Marian both had the same ill after-effects from the alcohol. "I am not having a swell time," she told him.

"Hey, mind if I take the wheel for a while?" said Jack, nervously.

CHAPTER FOUR
Jones Makes a Mistake

Not knowing the value of the piece of parchment, Marian had sold it to Lao Neypes, a dangerous gangster who had tried to double-cross Jones on several previous occasions. Neypes agreed to hand over the parchment in exchange for an urn containing the ashes of Hibachi, the ancient Japanese shogun.

When Jones made the delivery at Lao Neypes' private club a few days later, Neypes talked him into having a drink to celebrate. He failed to notice that Neypes was pouring his own drinks out of a different bottle.

After a few glasses, Jones was getting that familiar soft-headed feeling. Neypes was handed a cup of dark, steaming liquid.

"Feeling all right, Dr. Jones?"

Jones eyed the cup suspiciously. "What's that?" he said.

"Antidote to the booze you just drank," said Lao Neypes, laughing.

Jones lunged for it, but Neypes held it away and then ran out with both the urn and the parchment. Jones downed the contents of the cup.

"Hey!" he shouted. "This is just coffee!"

After a couple of minutes, he felt more awake, but that was all. He could tell he was still drunk. Not wanting to risk driving after Lao Neypes in that condition, he did a mental search of Lindenwood's data, trying to remember how to overcome the effects of alcohol.

"Cold showers and oxygen could counteract the influence of alcohol," the notes had said. He had to run back to his hotel.

Marian found him later, standing shivering in front of the hotel, dripping water on the street, and inhaling deeply.

"How do you feel?" she asked. He told her he felt drunk.

"Right. You're hyperventilating. You might pass out or get pneumonia, but you won't get sober."

She got him a towel and told him to sleep it off.

"You're not the man I knew ten years ago," she said.

CHAPTER FIVE
Jones Makes a Discovery

Jones returned, empty-handed, to the archaeological diggings in western North America. He had lost the fragment to the manuscript. He had consumed all the alcohol in fruitless attempts to substantiate theories that turned out to be fantasies.

He had almost decided to try another line of work when he made a startling conclusion: The Well of Spirits had nothing to do with the afterlife. It had to do with *distilled* spirits!

He explained it to no one. His collegues thought he had finally seen one too many snakes and had gone loony, as he spent weeks and months digging in old piles of bottles and cans.

Finally, his hunch proved correct. He found a cave that was littered with alcohol containers and defaced with painted slogans on the walls. As a "Well of Spirits" it wasn't much, but he couldn't complain because he dug up the manuscript from beneath the rubble.

It was faded and torn, but it was still legible. It contained the information with all the numbers that Jones had seen on Lao Neypes' parchment. It was written in the old language that had been called English.

"Driver," it said.

He stuffed it in his satchel and waited for the darkness.

continued

EPILOGUE:

Jones and Marian delivered the ancient manuscript to Lindenwood.

"This is the key, Abner," he told the old professor. "Once I deciphered some of the hieroglyphics, it was easy. This manuscript became my 'Rosetta Stone' for determining the facts from the fiction on alcohol.

"Abner, I think I understand where you went wrong. You didn't discover any facts about ancient Americans and their use of alcohol. What you found were the myths and the folklore about alcohol. And believe me, that kind of folklore can present a serious danger to life and limb, as I found out. Alcohol, even in relatively small quantities, is a pretty dangerous substance to consume when you're trying to do some complex, demanding function such as drive or operate machinery. Did anybody ever think of a different way to experiment — white mice or something?"

Lindenwood snatched the crumbling paper from Jones' fingers and quickly stowed it in a wall safe, twirling the dial. He changed the subject.

"Ari, you've been gone so long you don't know my latest discovery! I've uncovered what I believe to be artifacts of their religion. I've found hundreds of small, metal altars that they used to worship their gods! They put money into these altars and then they could call upon such minor deities as Zaxxon, Galaxian, Donkey Kong and the voracious Pac-Man. . ."

Jones and Marian had to listen for three hours before they could escape from the old man's ranting. Jones was dejected.

"You know he'll take credit for my discovery," he said. "He always does. Remember? I was the one who advanced the theory that thousands of ancient Americans had died through their refusal to make use of passenger restraints in their automobiles.* But who gets credit in all the archaeological journals? Your father."

Marian took his arm and steered him toward the car.

"Come on," she said. "I'll buy you a drink."
"What, for both of us?"
"Sure," she said.
Jones pulled her away from the car.
"We'll walk," he said.

**Look for "Arizona Jones and the Band of Mystery" soon at a safety magazine near you.*

BAL CHART

	1 Drink				2 Drinks				3 Drinks				4 Drinks			
After hours	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
Weight pounds																
80	—	—	—	.02	—	—	.05	.08	.07	.10	.10	.10	.12	.12	.15	.15
100	—	—	—	.02	—	—	.04	.06	.05	.07	.08	.09	.09	.10	.12	.13
120	—	—	—	.02	—	—	.03	.04	.03	.04	.06	.08	.06	.08	.09	.11
140	—	—	—	.01	—	—	.02	.04	.02	.03	.05	.06	.04	.06	.08	.09
160	—	—	—	.01	—	—	.02	.03	.01	.02	.04	.05	.03	.04	.06	.08
180	—	—	—	.01	—	—	.01	.03	—	.02	.03	.04	.02	.04	.05	.07
200	—	—	—	—	—	—	.01	.02	—	.01	.03	.04	.01	.03	.04	.06

	5 Drinks				6 Drinks				7 Drinks				8 Drinks			
After hours	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
Weight pounds																
80	.17	.17	.19	.20	.19	.22	.22	.25	.25	.27	.27	.30	.29	.30	.32	.33
100	.13	.14	.16	.17	.16	.18	.19	.21	.20	.22	.23	.25	.24	.25	.27	.28
120	.09	.11	.13	.14	.13	.14	.16	.17	.15	.17	.19	.20	.19	.20	.22	.23
140	.07	.09	.10	.12	.10	.12	.13	.15	.13	.14	.16	.17	.15	.17	.18	.20
160	.06	.07	.09	.10	.08	.09	.11	.13	.10	.12	.13	.15	.13	.14	.16	.17
180	.04	.06	.07	.09	.06	.08	.09	.11	.09	.10	.12	.13	.11	.12	.14	.15
200	.03	.04	.06	.08	.05	.07	.08	.09	.07	.09	.10	.12	.09	.10	.12	.13

Numbers equal the percentage of alcohol in the blood. Dash (—) = a trace of alcohol.

This is a copy of the fragment from the "ancient manuscript on alcohol," a chart listing the Blood Alcohol Level (BAL) for people of different weights, drinking at different rates. Charts like this one assume that the drinker has eaten, and that he is having an "average" drink, so they serve best to show you how fast you really do become intoxicated. The only safe amount to drink before driving is none at all.

EDITOR'S NOTE:

Of course, Dr. Jones' theories on alcohol were the correct ones. He had no way of knowing it, but in his experiment he was showing the progressive effects of alcohol intoxication. At 170 pounds, he was at about Blood Alcohol Level (BAL) .02 after two drinks. He reached .04 after three drinks, .06 after four, .08 after five, and .10 — the legal level of intoxication in "ancient America" — after six drinks, assuming he had them in a period of two hours.

He also had no way of knowing that it would take over six hours for his body to get rid of that alcohol. The human liver, which does most of the detoxifying of alcohol, oxidizes enough to lower the Blood Alcohol Level by

Dr. Jones found a new use for a seat belt, although buckling it around his middle might have been easier.

Our thanks to Lt. Col. BOBBY REMINGTON, for the use of his Model A replica.

Jack felt better with Jones out of arm's reach of the wheel.

After four or five drinks, Jones began to feel his strategy was a rousing failure.

Lao Neypes had the antidote for Jones' condition. Or was it?

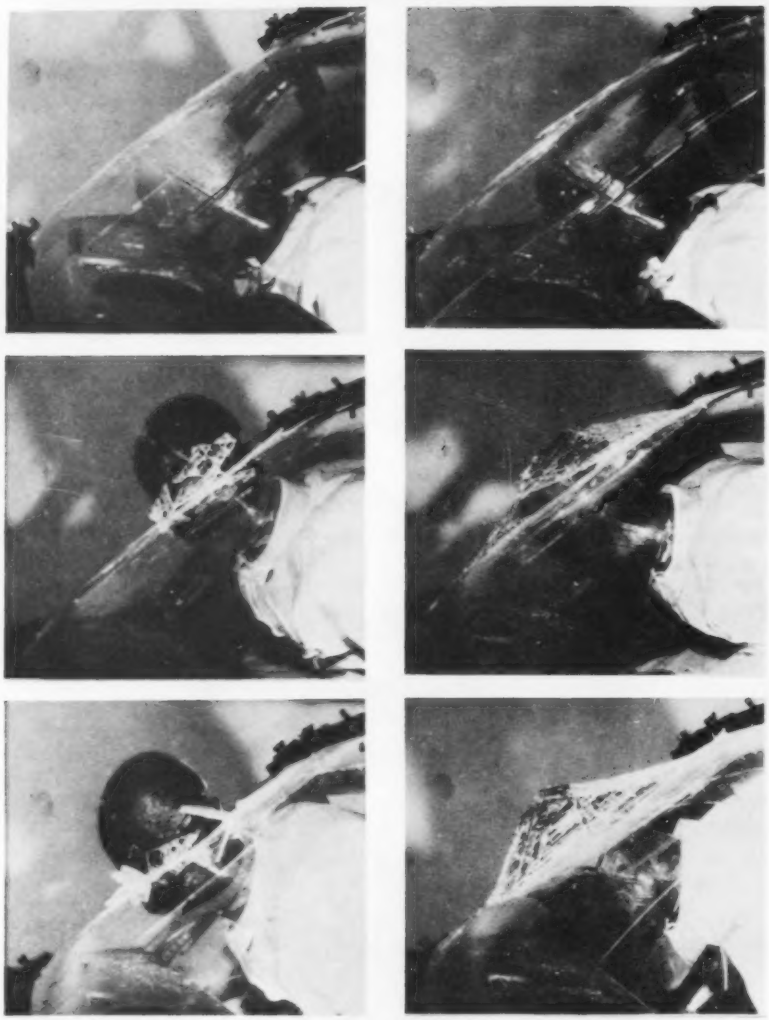
(right)
Jones discovered the ancient manuscript, left by a long-dead civilization.

only .015 each hour.

Of course, many people drink faster. If he had drunk those six drinks within one hour, the liver would have got farther behind, and he would have reached .12, with eight hours needed for complete elimination from the body.

But all these numbers are approximations, and they depend on even more variables than were listed in this story. The best number to remember is the number of drinks it is safe to consume before driving — none.

NO-CUT Windshields



The first HPR windshields (left) bonded a layer of .015 inch thick PVB between two layers of glass and provided increased protection over the single sheets of tempered or toughened glass previously used. Since introduction, manufacturers have been increasing the performance of the HPR windshield in various ways including increasing the PVB sandwiched layer to .030 inch thick (right) until penetration speed of today's windshields is about 26 mph.

Even if you're a professional athlete with a no-cut contract you run the risk of facial lacerations when involved in an automobile accident.

Motor vehicle crashes are the leading cause of severe head and facial injuries according to a *Journal of Trauma* article by Trudy A. Karlson. More than 600,000 such injuries result from crashes each year.

Passenger cars are involved in more than 85 percent of these crashes and their occupants account for approximately half of all hospital-treated facial injuries associated with crashes, notes a National Highway Traffic Safety Administration (NHTSA) regulatory evaluation.

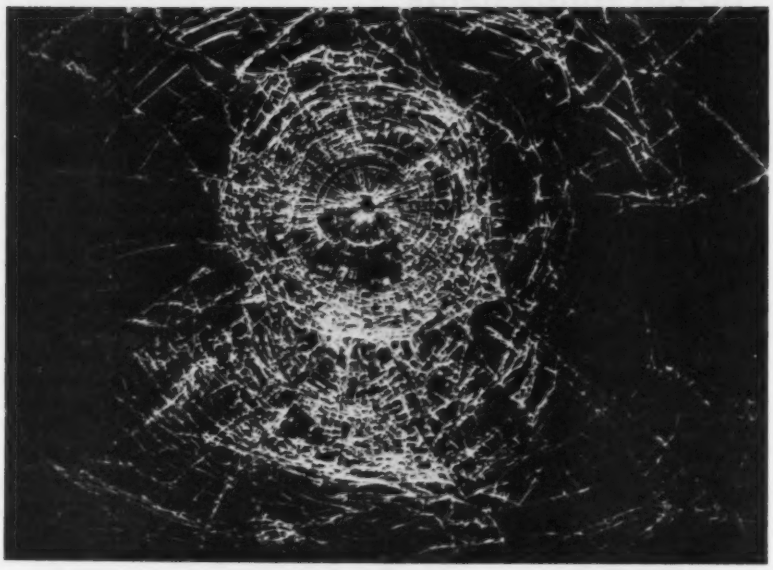
More than 235,000 vehicle-related lacerative facial injuries are caused by contact with vehicle glass. Windshields account for approximately 75 percent of these injuries, while side and back windows cause the remaining 25 percent according to the NHTSA report.

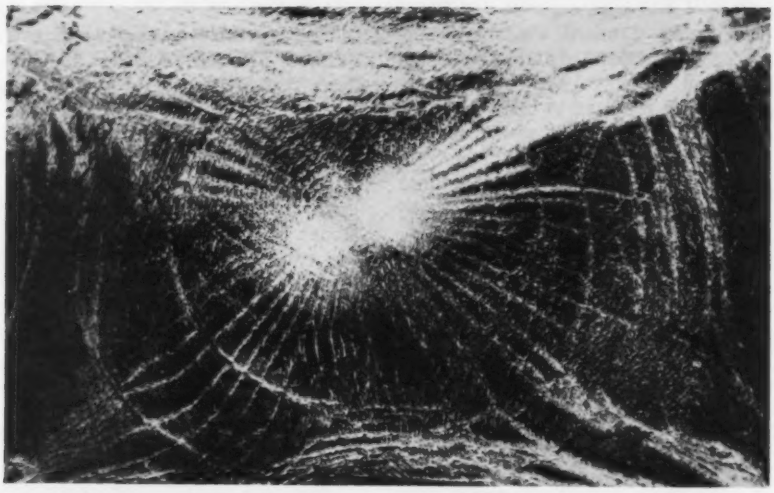
Details of tests involving new types of windshield construction were described in papers presented to the Society of Automotive Engineers during a session of the 1984 SAE International Congress & Exposition held in Detroit earlier this year.

The authors of one of the papers, E. Philip Doolittle, Thomas B. Horton and H.P. (Bert) Blom, all of General Motors Corp., traced the history of windshield construction and safety from the infancy of the automobile to the 1980's. Noting that there were no windshield-related injuries in the earliest days of the motor car, they quickly pointed out the reason — there were no windshields. However, there were many instances involving facial collisions with the pesky UFI (unidentified flying insect).

The first windshield material, sheet glass, sometimes led to "traumatic effects" on occupants involved in an accident, and this material soon gave way to laminated glass, first used in 1913. This design enhanced safety by using a layer of celluloid sandwiched between two sheets of glass and achieved widespread popularity by the 1930's.

This "laminated" glass was continually improved, including the replacement of sheet glass with plate glass in 1939 and the introduction, in 1946, of a thicker (.015 inch) layer of polyvinyl butyral (PVB) to replace the vinyl layer previously used. According to the





The difference between a standard windshield's breaking pattern (above) and a windshield with an interlayer of plastic (below) is apparent in these photographs.

authors, these improvements served to "increase windshield impact resistance, hold broken windshields together and hold occupants in the vehicle, but more improvement was possible."

The improvements that followed resulted in the current generation of laminated windshield, achieved by doubling the thickness of the PVB layer and controlling its moisture content. These changes gave the windshield greater strength along with increased elasticity. Known as high puncture resistance (HPR) laminated glass, this has been used in all North American automobiles since 1966. The authors claim that the use of HPR construction, "combined with improvements in windshield retention, has proved to be highly effective in retaining occupants in the automobile, and in reducing the severity of lacerations, as compared with the glass previously used."

Although this design significantly improved windshield safety performance, the possibility of lacerative injuries still exists from shattering of the inner glass layer. An analysis of actual crashes in which the head of an occupant struck HPR windshields was reported to the 27th Annual Proceedings American Association for Automotive Medicine in 1983 by G.M. Mackay and C.A. Smith. They estimated that in a 25 mph collision an unrestrained occupant has an 80 percent chance of receiving facial damage and a 30 percent likelihood of receiving lacerations requiring sutures.

Manufacturers have attempted to alleviate this hazard by several methods including varying the dimensions and strength of the inner glass or middle plastic layer that would contain the shattered glass surface.

A number of polymeric materials have been studied to determine if their combination with safer windshields would result in improved anti-lacerative properties said N.W. Johnston, S.H. Herliczek and C.E. Ash of LOF Glass/Libbey-Owens-Ford Co., in their SAE paper.

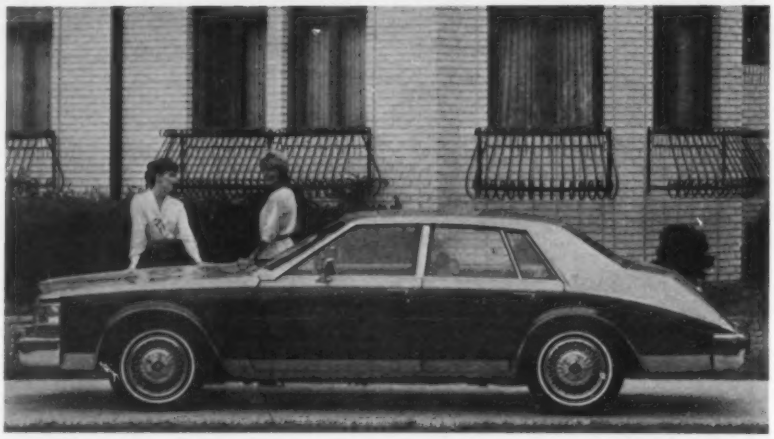
Even before testing, the polymeric films were screened for transparency, haze, optics, abrasion, plasticity, stability, impact strength, break pattern, weathering and processing.

The windshield construction evaluated in the tests described by Doolittle, Horton and Blom involved bonding a layer of polyurethane to the inner surface of a standard HPR laminated Windshield. While the design has been on 30,000 vehicles in Europe for a number of years, little information was available on its durability and safety effectiveness. Nor had these vehicles been exposed to North American climate and use.

Three testing stages were selected for evaluating the new design: laboratory tests on the material itself, controlled impact tests to determine its potential for protecting occupants and an in-use field test to measure its performance under real-world conditions. After results of the first two test approaches proved favorable, a field testing program involving 2500 cars was begun.

According to Doolittle, Horton and Blom, field results have been encouraging, but they point out that "evaluation of haze development caused by abrasion of the anti-lacerative inner surface will take several more years of exposure." In addition, the plastic surface can be damaged by the removal of stickers and decals and stained by prolonged exposure to cigarette or cigar smoke. Some of the adhesives used on stickers and decals actually combine chemically with the plastic liner, making removal "virtually impossible."

continued



The 1985 Cadillac Seville Elegante comes standard with GM's "Inner Shield" windshield that features a two-part plastic layer applied to its inside surface. The "Inner Shield" windshield is being used only on Seville Elegante initially because manufacturing capacity to produce it is very limited.

In evaluating safety performance in field testing along with the potential of the windshield for widespread use, the General Motors authors report that "facial lacerations caused by contact with the edges of cracked or broken glass have been prevented in the accidents investigated." However, they caution that a number of issues "must be resolved before anti-lacerative glazings can actually achieve volume use in this country," and suggest that "perhaps the most difficult problem to overcome remains the education of consumers and those who apply decals to windshields."

In another SAE paper, Ian S. Jones and Howard S. Stein of the Insurance Institute for Highway Safety with John J. O'Neil of the Maryland State Police detailed another test program.

Since October 1981, the Maryland State Police have equipped a portion of their new vehicles with the Securiflex inner guard windshield. This windshield is essentially a standard HPR windshield with an additional plastic layer bonded to the inside (occupant) surface.

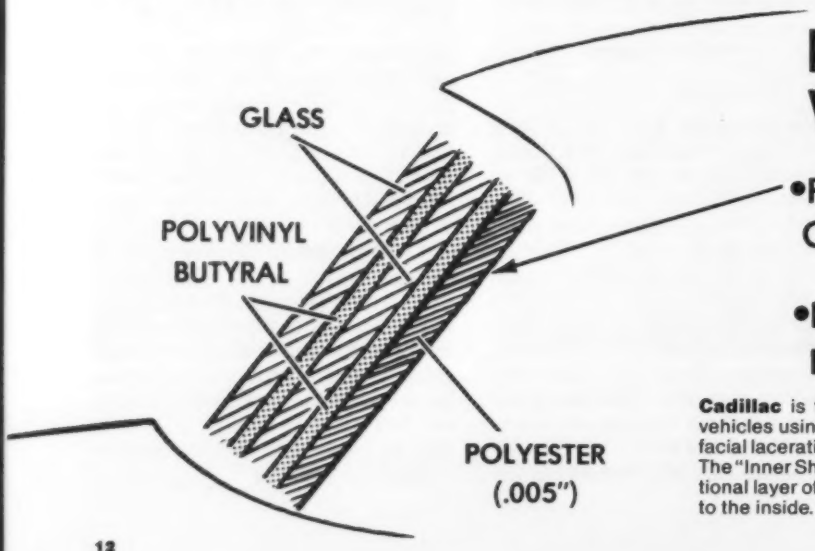
The Maryland State Police demonstration fleet consists of 100 Securiflex equipped vehicles, 50 Gran Fury Plymouths (1981 model) and 50 Ford LTD's (1982 model), and similar groups of vehicles designated for comparison.

Visual inspections and measurements of the reflective characteristics (related to visibility) for both Securiflex and designated standard windshield surfaces were performed at the start of the program. In May 1983 these inspections were repeated to update surface damage (i.e. chips and scratches) and reflectometry measurements of the Gran Fury's. The average exposure of these windshields was over 37,000 miles during 13-15 months.

Comparison of the results from the initial and update inspections indicated the visual performance of the windshields was not substantially different. Specifically, the frequency and severity of the damage to the windshield surfaces (i.e. chips and scratches) from normal use were similar and the resulting loss in visibility (defined in terms of increases in haze) was not significantly different between Securiflex and standard windshields.

Additionally, the Securiflex windshield performed as expected in that no glass fragments came into the vehicle although several were shattered by external impacts from objects such as stones. More importantly, the Securiflex windshield did prevent lacerative injury in a crash involving one of the Ford LTDs traveling at highway speeds.

NHTSA has concluded that if this type windshield was installed in all vehicles, over 170,000 facial injuries would be eliminated annually producing a savings of over $10.8 million in medical costs.

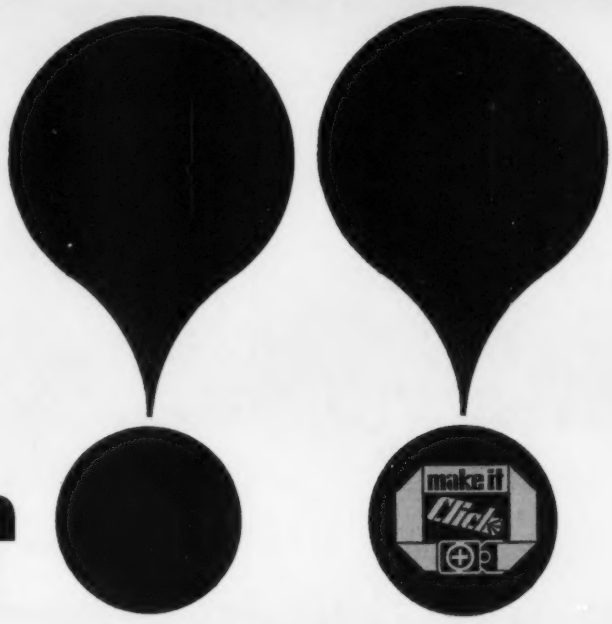


INNER SHIELD WINDSHIELD

- FLEXIBLE SHIELD ON OCCUPANT SIDE
- ISOLATES OCCUPANT FROM BROKEN WINDSHIELD

Cadillac is the first domestic auto manufacturer to produce vehicles using a new windshield designed to virtually eliminate facial lacerations that could result from broken windshield glass. The "Inner Shield" windshield is an HPR windshield with an additional layer of PVB plus a .005 inch sheet of polyester laminated to the inside.

ReMinder



by 1st. Lt. STEPHEN ROBISON

Andrews AFB, MD

Occasionally life's experiences underline for us things we may already know. Like balancing too many groceries in your arms can result in broken eggs. Likewise, doing 65 on the Interstate probably explains the presence of that state patrolman in your rearview mirror. Or long conversations on the phone with your brother in Missoula are apt to produce outrageous telephone bills at the end of the month. Bells of recognition ring in your head: "Aha!" you think, "I knew it! Dropping eggs is rough on them. Those radar speed traps really work! Sure enough, Missoula is *not* a local call."

Although they tell us what we already know, when these learning experiences occur they can be very unfamiliar in their brutal simplicity, decidedly not funny, and sometimes even deadly in their seriousness.

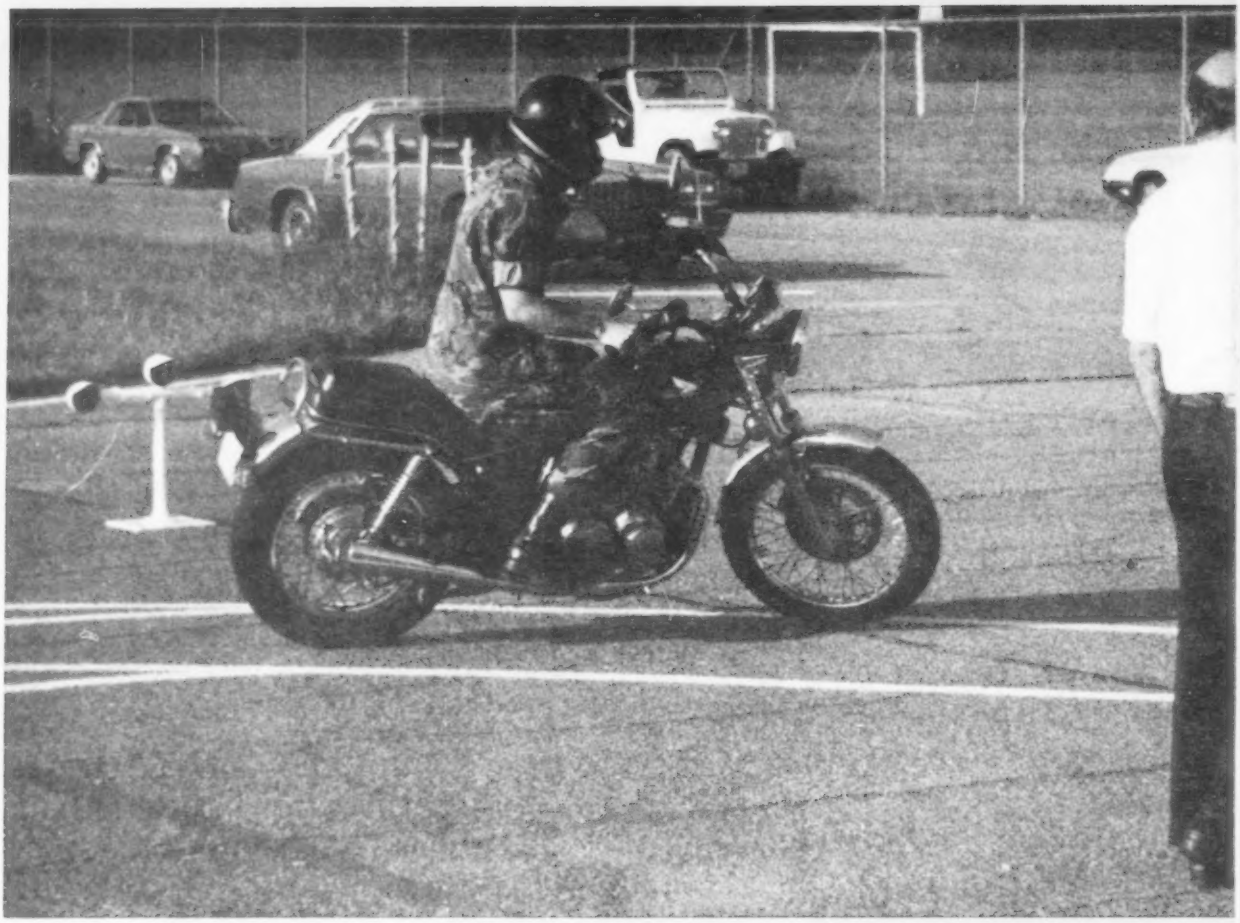
Summer thundershowers throughout the country turn many roads into oil slicked obstacle courses. Rainshowers when combined with automobiles can result, as everybody knows, in busy days for insurance adjusters and body shop men. And ambulance drivers. And emergency room staffs. And funeral directors. We know these things. Everybody knows these things.

Another thing everybody knows is that seat belts, as the old slogan goes, save lives. A few years ago, after being trained as an emergency medical technician, I worked one summer as an ambulance attendant, and witnessed enough of what happens when people bounce around inside automobiles — or leave them at 60 miles an hour — to make wearing seat belts a habit with me. You could say I'm a believer.

But life sent me a message the other day, only a couple miles from base. I was being reminded of something I don't think about very much. As I drove home after a light rain shower, I saw a cluster of people up ahead at the side of the road. Then I saw the car. After I'd parked and gotten my first aid kit out of the trunk, I went back to check on the driver. No emergency personnel had arrived at the scene yet; and they had a real job ahead of them. The 200SX was upside down, apparently having lost control on a rain slicked curve of the suburban road, and had come to rest in someone's front yard. The driver was conscious, but dazed. He was upside down inside the compacted car, his weight resting on a painful shoulder. His feet were up around the dash board and steering wheel. His neck hurt, he said. He could barely move his fingers. From practice I surveyed his body. "Can you feel my hand? Can you wiggle your toes? OK, don't move now..." As if he were going anywhere.

The inside of a car that's upside down looks so unfamiliar. What's a steering wheel doing over here on the right? The seat belt was neatly retracted, I noted, up there on the floor.

As the rescue crews began to arrive, I let them know what I'd already found and gave them their room to work. The firemen were preparing spine boards and a cervical collar for the difficult task of extricating the driver from his flipped car. Packing my first aid kit back in my car I thought about what I'd just seen. How bad the driver's injuries are I don't know for sure. Medics aren't doctors, and I don't have x-ray vision. But I thought about that eerie scene: The driver, out of his seat, wedged down on the car's ceiling like a man who's fallen out of bed and then had the bed fall on top of him. As I left, a little detail of the accident stuck in my mind; I thought about it all the way home. In fact, I've been thinking about it all week: The seat belt was stowed neatly out of the way. That's the way lots of people drive, where you don't have to notice it, and where it won't do you a bit of good when you suddenly need it.



by JO3 BOB SCOTT **Naval Air Facility, Washington, D.C.**

It is probably a safe assumption that most motorcycle riders with over a few months on the road consider themselves to be "good riders."

Sure, they can out-accelerate cars, weave through slow traffic, pitch their bikes over into gravity-defying lean angles and scare the living soul out of anyone who dares to climb on as a passenger.

However, when a mandatory motorcycle operator's skill test is announced (completion of which is necessary to retain base riding privileges), the bike riders moan and complain:

"What a hassle! I know how to ride my bike; why should I waste part of my day off or part of a productive work day dodging traffic cones in a parking lot?"

Some say, "I already had to pass a riding test to get my license."

Grudgingly they show up for the test. Preconceived notions fill their heads: Visions of dozens of bright orange traffic cones dotting the test site, and a balding instructor with a white "CHiPs" type half-helmet, reflective safety vest around his bulging middle and huge plastic safety goggles over his thick, military-issue glasses.

But what they really find is a carefully laid out range with painted lines, electronic timing and signaling gear and, surprisingly enough, only two small traffic cones (and one of them isn't even orange!).

And the test instructor? — A young Air Force technical sergeant, in uniform, qualified in the most up-to-date methods of testing and instruction.

This is the Motorcycle Safety Foundation (MSF) Motorcycle Operator's Skill Test (MOST) II given by TSgt. Stephen DeVore, Andrews AFB motorcycle safety manager and Mel Willsie, an Andrews safety specialist.

As the testing begins, some riders find out just how "good" they really are. Tests of panic stopping (straight and in a turn), turning speed judgment and obstacle avoidance start to show the shortcomings of even the more experienced riders.

The test is objective. It works on a point system, with various amounts of points accumulated for each "mistake" the rider makes on the course. Electronic timing equipment measures each rider's speed on certain segments of the course, such as the panic stop sections. A reference chart from the MSF gives safe stopping distances for indicated

Keep it between the lines. Marine Cpl. Rodger Bailey concentrates on the course under the watchful eyes of Mel Willsie.

(right)
On the binders. Marine Cpl. Rodger Bailey executes the panic stop in a turn, one of MOST II's many challenges.

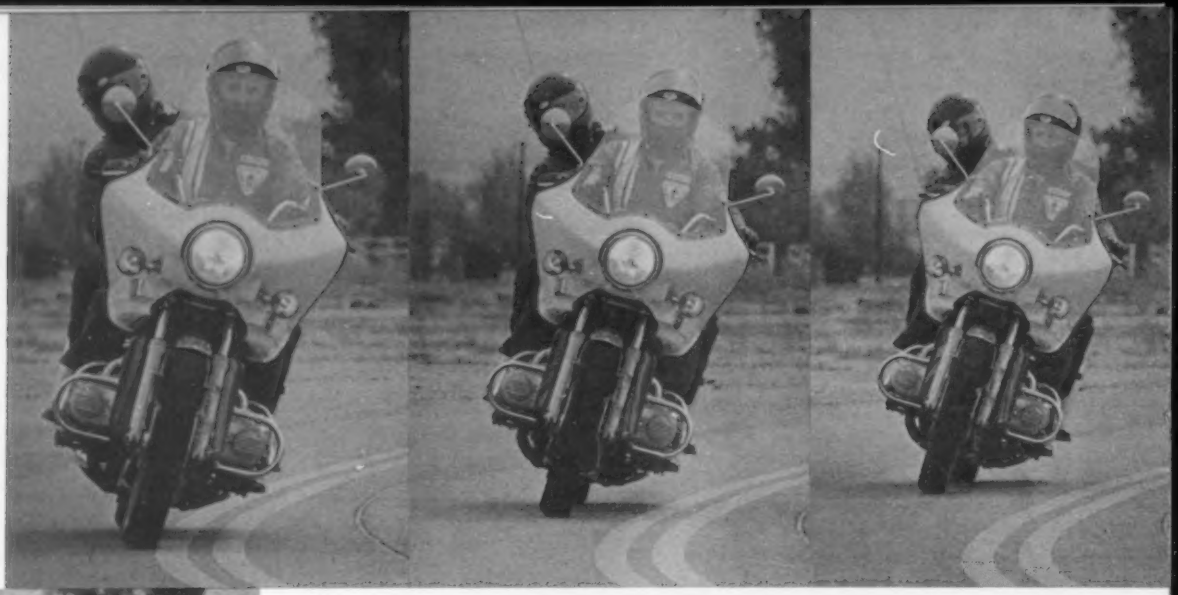
U.S. Navy photos by author

speeds.

It is all down in black and white; you either meet the set standards or you do not. No personalized judgment from the test instructor affects the scores. It is a fair and unbiased test for all involved, regardless of the type or size of their bike.

Much more fair, it seems, than some state's licensing tests, where the person giving the test makes the pass/fail decision from merely watching the rider perform a few short maneuvers.

But above all, this test measures the riders' ability to perform the skills necessary to stay alive; the skills that a self-proclaimed "good rider" might not realize he is lacking.



THE MOTORCYCLE PASSENGER

Make or Break

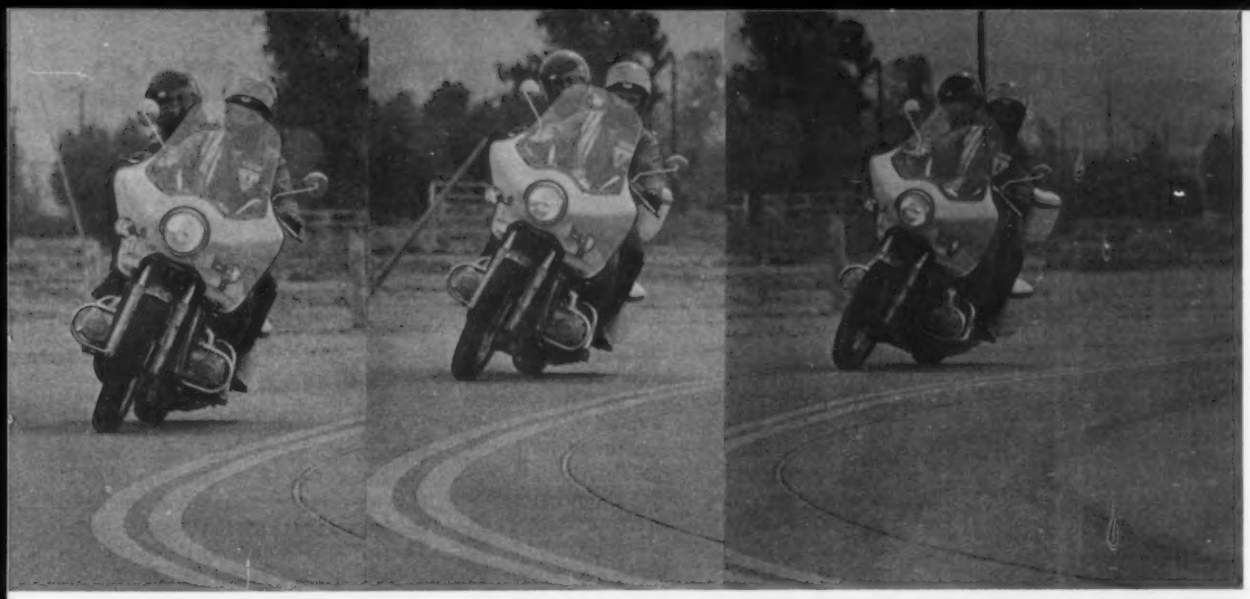
by A1C MARK W. CHEESMAN
Vaihingen, Germany

Photo sequence counterclockwise from far right, top

Editor's note: Airman Cheesman relayed this story and follow-up explanation to DRIVER in order to prevent other readers some pain or, possibly, worse. It concerns the effects a motorcycle passenger has on the control and safety of a cycle.

It was a warm and clear star-filled August night. I was with a group of 12 motorcycles rumbling down the highway on our way to Milwaukee after spending a day of fun at an amusement park in the outskirts of Chicago.

A few of us needed to stop for refueling and proceeded to exit the freeway while the majority of the two-wheeled convoy continued onward toward the destination. After topping off our tanks, we headed back to the six-laned I-strip



along a frontage road that led to the on-ramp.

Two of us were traveling in single file behind a car doing about 50 mph when our day of leisure abruptly came to an end.

Without apparent reason, the car slammed on its brakes just as it was entering the on-ramp. The situation ripened when I had to apply the brakes over a gravel littered patch of asphalt causing the cycle to fishtail and slide.

Realizing that there was insufficient distance to avoid a collision by mere braking, I released the brakes and resorted to evasive maneuvers which cleared me from the immediate menace of embedding my new cycle, girlfriend and self in the back end of the Continental.

After a microsecond of relief, I found myself on the gravel shoulder of the on-ramp which made all thoughts of braking or quick steering at that speed extremely short lived. The only option was to ride out the terrain through a grass-filled gully, and back up onto the blacktop.

Although packed with adrenalin, I had the bike under control to the extent that I merely had to regain footing (so to speak) upon reaching the frontage road once more. Or so I thought until the cycle for some unfathomable reason suddenly went down like a rock in water.

My screams pierced the summer air as I tumbled from my machine, helplessly watching my leg bend in places it was not meant to, and came to a stop in the middle of the road seemingly abandoned in the dark that now engulfed me.

It was over and, except for a faint sobbing from somewhere, the night was still as though the whole incident had been a nightmare to be forgotten. That is, until the pain hit, bringing me back to reality complete with accompanying scrapes, burns and compound fractures of the right leg which would take a year and a half of my life to properly heal.

My passenger fared no better, suffering from a concussion, multiple road burns and, worst of all, a shattered knee cap.

Fortunately for you, this happened to me. I consider myself to be a very capable driver on or in a number of various vehicles. I've been racing cars for about nine years and riding cycles for about six. And I am very aware of mechanical upkeep, driving fatigue, defensive driving and making sure that alcohol never does the driving for me.

But the accident raises a point which I had never thought of, read about or been taught. With all my driving experience and safety education, I was not prepared for the one factor that caused my accident: THE PASSENGER.

After the near-miss with the car, my girlfriend panicked and thinking we were still going to crash decided that her best chance was to jump off the cycle while we were riding on the grass. That is what caused my cycle to go down and, being the driver, I had no choice but to go down with it.

You see, experienced cyclists can deal with cars slamming on their brakes, gravel on the road and wet grass because they've been conditioned to expect those sort of hazards. But unlike cars, where the passenger does not come into play in an accident situation (as far as control of the vehicle is concerned)*, the cyclist's passenger can make or break (no pun intended) the outcome of a potential accident.

So for those cyclists who are aware of the importance of educating their passengers (as well as themselves) on the effect the extra rider has on a cycle's operating behavior and the responsibility the rider must assume as a passenger on a motorcyle for the safety of both riders, I envy you because I have had to learn this the proverbial "hard way."

As for all the cycle owners who were not aware of this factor and its potentials, I sincerely hope that you benefit from my experience and incorporate this knowledge into your driving habits to make your future cycling safer and more enjoyable for you and your passenger.

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*Actually, an unrestrained passenger being flung around inside a car can affect the driver's ability to control the vehicle and therefore contribute to an accident.

Editor's note: For more information on two-up motorcycling see "There is no such thing as a motorcycle passenger" in the May 84 DRIVER.

TRUE ACCIDENTS

Following are a few reports of accidents involving Air Force members. We have removed names and references to dates and places.

SNOWMOBILE

An airman was at a house on base playing cards when he invited another service member to come over and join in. The member drove his snowmobile over arriving at about 1930, and began to play cards. They drank beer from 2100 to 0015, when the airman decided to go home. The second member offered to take him back to the barracks on his snowmobile. The driver wore the only helmet available. It was only a short distance to the barracks. They drove through the housing area and across a field. The driver noticed a guy wire highlighted with a yellow plastic covering which supported a utility pole. He decided to go under it. As they neared the wire, he saw a second guy wire, but was unable to avoid it. The driver hit the wire with his helmet and shoulder and the passenger hit it with his head and neck. Both were thrown from the snowmobile, which went on for another 200 feet. The driver went after the snowmobile and brought it back, pointing its headlight at the passenger. He was checking his friend when help arrived. The passenger was taken to the hospital, where he died at 0302 of a broken neck. The driver estimated he had been traveling at 30 mph when the accident happened. The speed limit in that area is 25 mph. Investigators concluded the accident was caused by speed and alcohol, with the contributing factor of a tinted windshield on the snowmobile that may have obscured the driver's view of the other wire.

NO BELTS

An officer and his wife were driving home after dinner and a movie. They were traveling north between 30 and 40 mph on a street, with their seat belts unfastened. An eastbound car failed to stop at a stop sign and hit the officer's car on the left side. The impact caused broken ribs, right arm and pelvis to the driver. His wife instinctively put her head on her lap, but the change in vehicle direction forced her head between the console and the floor boards. She was in a coma until she died four days later. The officer lost three months from work.

ALCOHOL AND BORROWED CYCLE

Two airmen were drinking beer in the dormitory at 2230. They went to the airmen's annex and drank more and then returned to the dormitory. At 0100, one airman borrowed the other's motorcycle, saying he wanted to go around the block. He lost control of the motorcycle and hit a metal guardrail. He apparently took evasive action before hitting it, from the four feet of gouge marks and 11 feet of skid marks found by investigators. The airman was thrown into the guard rail, tearing off his right arm and leaving 12 feet of damage to the guardrail. The motorcycle went under the railing and sustained minor damage. At the hospital, the doctors smelled alcohol on the airman's breath. He died at 0148 from massive blood loss and multiple injuries.

CAR, CYCLE AND ALCOHOL

Two sergeants left work at 1600 and went to the NCO club for drinks. Witnesses saw them consume several drinks each before they left the club at 2100. They went to visit a friend who lived in an off-base trailer park. The moment they walked in the door one of the sergeants asked to borrow the friend's motorcycle. He persuaded them to sit and talk for a while, and they each had another drink. About 2145 the sergeant borrowed the motorcycle and drove off, refusing the offer of a helmet. He drove to his home and got into an argument with his wife about riding while intoxicated. His wife and a neighbor took the keys away from him. After about an hour, the other sergeant went out looking for the motorcycle rider because the cycle's owner had become worried. He found the rider still arguing with his wife. After a discussion, the second sergeant was given the keys to the motorcycle. The first sergeant went along to pick up his shirt, which he had left at the cycle owner's house. They left about 2340. On the way back to the owner's house, traveling at over 70 mph, they collided with a car in an intersection. Both were thrown off the cycle. The operator received a fractured pelvis and spent two months in the hospital. The passenger, who had originally borrowed the cycle, struck a tree and was killed. Neither had received any formal motorcycle training.

CAR AND CYCLE

An airman was traveling south on a through street at 25 mph, approaching an intersection. A driver stopped at a stop sign on the cross street, but proceeded without yielding to the airman. The car hit the motorcycle in the left side, throwing the rider off. He was not wearing a helmet and received severe head injuries, from which he died three days later.

PASSING

Two sergeants and a civilian were traveling in an Air Force truck from the base to the city. The road was a narrow, two-lane road with the view obstructed by walls, trees and the slope of the land. The driver attempted to pass a dump truck on a gradual left curve. The driver of an oncoming vehicle, seeing the AF truck, braked and steered to the right, but the AF truck hit his vehicle anyway. The AF truck then swerved to the right, hit the dump truck, flipped and landed upside down off the right side of the roadway. The dump truck continued to the right, with its right wheels dropping off the pavement. Then it rolled over on its side, crushing the AF truck. The driver and both passengers in the AF truck died at the scene. There were no signs or markings on the road prohibiting a pass, but investigators determined the driver knew the road and had disregarded safety guidelines by attempting to pass.

SEAT BELTS

A colonel was driving on a four-lane highway, passing through a small community. He was traveling about 40 mph in a 45 mph zone. As he passed a church another vehicle left the parking lot and pulled directly into his path. He had time to steer a little to the left to reduce the angle of impact. His car hit the other at the left front wheel. The colonel was wearing seat belts and received no injuries. The couple in the other car were unbelted and ended up in the hospital.

Timely Topics

DRIVING FORECAST FOR WINTER STORMS

Drivers should be aware of weather forecasts and possible winter storm warnings before they head out on the road. The Automotive Information Council (AIC) says the terms used in winter weather forecasts can be confusing. Understanding the difference between a winter storm WATCH and WARNING could save you a lot of driving aggravation.

The following National Weather Service terms are used in winter weather forecasts:

A WINTER STORM WATCH means severe winter weather could affect the area.

A WINTER STORM WARNING means severe winter weather is imminent.

A BLIZZARD WARNING is used when heavy accumulation and blowing of snow are expected together with winds of over 35 mph. A SEVERE BLIZZARD WARNING means that heavy snow, winds over 45 mph and temperatures under 10 degrees Fahrenheit are expected.

The term SNOW, when used without qualification, means the snowfall will be steady and likely to last for several hours. SNOW FLURRIES are snowfalls for short times at intermittent periods. Visibility may be reduced severely during flurries although accumulations of snow may be small. SNOW SQUALLS are brief intense snowfalls of at least four inches in a 12-hour period or six inches in 24 hours.

An ICE STORM WARNING means a significant damaging ice accumulation is expected. FREEZING RAIN or DRIZZLE forecast is given when rain is likely to freeze as soon as it strikes the roads.

TRAVELERS ADVISORIES are issued to indicate dangerous driving conditions due to snow or freezing rain. Often specific trouble spots are named so you can avoid them.

RURAL ROAD PROBLEMS IGNORED

For the first tme in U.S. history, rural areas are growing faster than urban areas and, according to the Highway Users Federation, creating traffic problems which are not being addressed. The relocation of jobs and people in what were once relatively remote communities is creating traffic congestion. The roads serving these areas, according to the Federation's study, were not built to accommodate the heavy traffic volumes being generated — and there are no national plans to correct the problem. The Federation, which tracks road travel trends, said local authorities are alone in dealing with individual congestion situations because the national transportation policy is aimed largely at the problems of central cities.

GETTING THE LEAD OUT

As expected, the Environmental Protection Agency (EPA) proposed a 91 percent reduction in lead from gasoline by 1986 and said it was considering a total ban on leaded gasoline by 1995. Lead is used as a gasoline additive for boosting octane and lubricating valves. The EPA said it would cost refiners about $575 million to meet the new standards, but industry sources said the cost would be higher. Cars built since 1975 use unleaded gasoline. Health considerations were cited as the reason for the ban.

SAME CHILD SAFETY SEAT IN CARS AND PLANES

Two Department of Transportation agencies are taking action that will make it easier for parents traveling with small children to use the same child safety seat both in their motor vehicles and on commercial airplane flights. The National Highway Traffic Safety Administration (NHTSA) and the Federal Aviation Administration (FAA) will modify their child seating regulations to create a common standard. The former regulation did not allow the use of NHTSA certified child seats on airplanes without special FAA certification.

"We believe the actions taken today will enhance child safety in the air and on the highway," DOT Secretary Dole said. "This is particularly important since mandatory child restraint laws have been adopted in 49 states and the District of Columbia," the Secretary said.

NHTSA issued a final rule amending its child restraint systems standard so that such safety devices could be certified either for use in motor vehicles only, or for use in both motor vehicles and aircraft. When the new standard becomes effective in six months, FAA will rescind the requirements of its Technical Standard Order (TSO) C100, and take action to permit child restraints certified under the requirements of the NHTSA rule to be used in aircraft.

TOLL-FREE AUTO SAFETY HOTLINE RECEIVING CALLS AT RECORD PACE

More consumers than ever before are calling the National Highway Traffic Safety Administration's (NHTSA) toll-free Auto Safety Hotline this year seeking information on safety related materials and motor vehicle recalls.

NHTSA said it had logged more than 140,000 calls during the first seven months of 1984. If this pace continues, the Hotline will record more than 240,000 calls this year, eclipsing the record 223,000 calls received in 1982.

Established in 1975, the Auto Safety Hotline was expanded in 1982 to include broader areas of consumer and safety information to the American public.

Most of the consumers who dial the Hotline either ask for recall information or report safety problems they have experienced with their cars. "In the past seven months, more than 7,000 consumers have returned Hotline vehicle owner's questionnaires which assist the agency's defects investigation program," said Diane K. Steed, the NHTSA Administrator.

The Hotline may be reached by dialing 800-424-9393 from anywhere in the contiguous United States including the Virgin Islands and parts of Puerto Rico. In the Washington, D.C. metropolitan area, the number is 426-0123. Operators are on duty from 8 a.m. to 4 p.m. eastern time on weekdays. On weekends and after hours on weekdays, a recorded message asks the caller to leave his/her name and address, as well as his/her request for information.

Hotline operators are trained to offer assistance on non-safety related automobile problems by referring calls to other federal agencies, such as the Federal Trade Commission, which handles automobile warranties or service problems, or the Environmental Protection Agency, which deals with automobile emission problems.

driving at CHANUTE

Motorists on and around Chanute Air Force Base, Illinois, are never plagued with metro traffic jams. However, Mother Nature and local farm machinery can produce unusual hazards seldom encountered elsewhere.

On the base itself traffic moves smoothly, despite nearly 20,000 registered privately-owned vehicles. There are no major construction projects creating detours, and staggered work hours for permanent-party personnel and technical-training students help prevent congestion on Chanute streets.

Off base, conditions can be more adventurous, as anyone who has lived in the North knows. Snow may fall between October and April and a storm can sweep across the Illinois plains in a matter of hours. While state crews are well-equipped to keep highways open, there are many secondary roads cutting through the open farm country that are not regularly cleared. The priority is major routes, with some farm roads getting plowed as conditions permit. High winds occasionally cause roads to be closed by drifts, but road crews often have them reopened within the day.

Some drivers feel more comfortable with snow tires during winter. However, the Chanute Safety Office advises that reinforced tire chains and good standard-tread tires provide the best traction on snow-packed roads. Studded snow tires are prohibited in Illinois.

Summer presents a different concern. From the start of planting season in May through the final corn and soybean harvests in late fall, oversized farm machinery frequently transit the roads. Caution is the key. The machine operators cooperate with drivers, but the sheer bulk of the equipment dictates extreme care when overtaking them on narrow farm roads.

Safety officials also warn newcomers to the area about the narrow roads that intersect the millions of acres of corn. During late summer when the corn is as high as a semi-driver's eye, the chance of a back-road collision is greatly increased. There are many blind intersections without yield or stop signs on the farm roads, and they can sneak up on drivers before they are aware of the hazard. Drivers should slow drastically or even stop at these intersections to see if the way is clear.

While four-way stops have been eliminated from Chanute, they are still common throughout Illinois. The rule is: First one at the intersection has the right-of-way. If two or more vehicles reach the intersection at the same time, the one on the right goes first. Caution is necessary at four-way stops in order to avoid challenging extremely aggressive drivers who fail to yield right-of-way.

As anywhere, driving in East Central Illinois takes common sense, caution and a drive-defensively attitude. Chanute's Safety Office conducts a course on local driving conditions and laws, helping make motoring in the area a safe and pleasant experience.

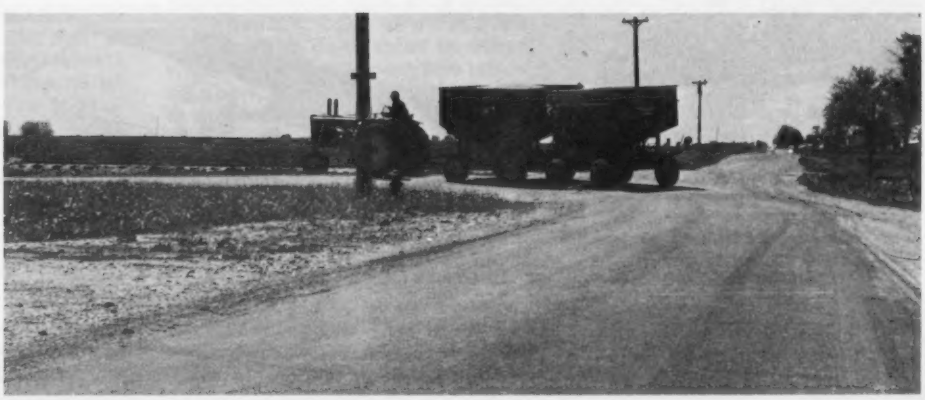
This is the fourth of a series of articles about driving conditions at ATC technical training centers.

by JYM DINGLER
Chanute Air Force Base, Illinois

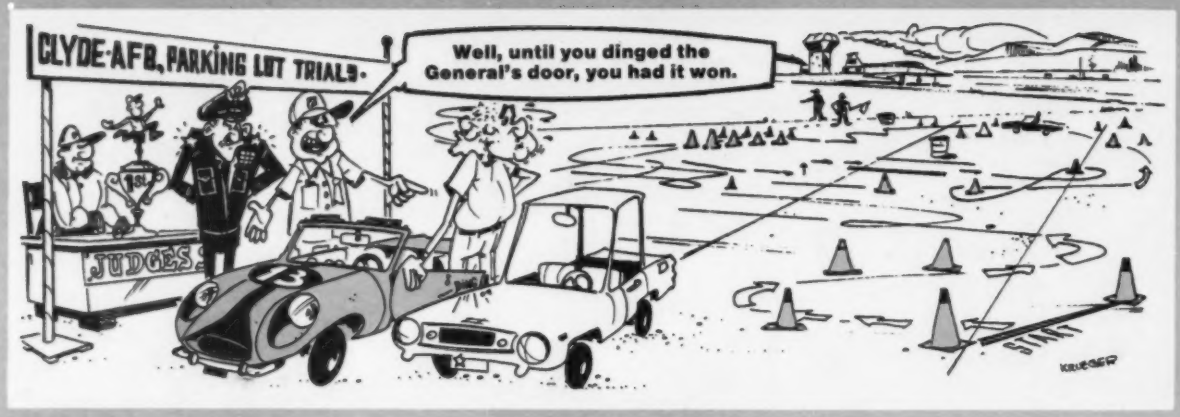
Borman Drive, approaching Chanute Technical Training Center Headquarters, is typical of the base's many tree-lined streets. Traffic congestion is infrequent.
U.S. Air Force photo

Wide-bodied farm machinery can be a hazard to drivers in East Central Illinois. Chanute AFB is in the middle of America's most productive corn and soybean country, and farm machines ply the roads throughout summer.
U.S. Air Force photo

(above)
While main thoroughfares are well-plowed, Chanute drivers must learn to drive in snow conditions on lesser-roads.
U.S. Air Force photo by Gene Fuller



(right)
Warm weather means farm machinery on East Central Illinois roads. Passing can be a hazard.
U.S. Air Force photo



TUNE UP

"I meant to tell you, you're being transferred to Hickam AFB."

"I just asked you how far it would go on a tank of gas — now take me back to Texas!"

And then there is the guy who defrosts his windshield with a bucket of warm water.

"I'd write a ticket, but it's bigger than the car."

"Brother-in-law or not, next year we get a trailer hitch!"

tteecc!!h

COMMENT: My mechanic has done everything possible to my late model, electronically controlled engine, yet it still has a spark knock. Not all the time, mind you, just every now and then. The timing is "right on the button" as called for by the car maker. The spark plugs are the correct heat range and part number. There are no vacuum leaks, and the exhaust gas recirculation (EGR) valve checks "good."

The mechanic says there is nothing wrong with the manifold absolute/barometric pressure (MAP/BARO) sensor but is about to change them as a last desperate measure. He thinks I might have a "flying short or whatever."

He said he knew that a faulty coolant sensor could lead to detonation, so he checked it out with a digital voltmeter and ohmmeter, but the specs checked out OK.

He even went as far as to check for leaking valve stem seals because he knew that when they are badly worn or cracked, oil enters into the combustion chamber. Then, he says, you can get a rapid carbon build-up and an increase in the compression ratio with detonation as the end result.

Is there anything that we might have overlooked?

REPLY: According to the people at Champion Spark Plug Company the problem may be your left foot.

Some late model cars are equipped with an EGR solenoid that receives an on-off signal from a switch connected to the foot brake pedal. Maybe, just maybe, you're "riding" the brake pedal while driving. When this occurs, the solenoid blocks vacuum needed to operate the EGR valve.

As a result, the combustion chambers do NOT receive any blending of spent exhaust gases which are needed to lower peak combustion chamber temperatures and, of course, help reduce the formation of NOx (Oxides of Nitrogen). As you should know, higher than normal peak combustion temperatures are one of the major reasons for detonation.

By the way, the brake switch has to be properly adjusted. If not, it may be sending a continuous signal to the EGR solenoid blocking vacuum. Without vacuum, the EGR valve cannot operate.

COMMENT: I've just installed new wiper blades and they're no better than the old ones. What's wrong?

REPLY: The people that make Anco wiper blades tell us that while their blades are made of the finest rubber compounds, they do not contain a detergent or solvent dispenser for dissolving the oil, tars or industrial pollution that settle on windshield surfaces. These substances cling to the glass and are often invisible to the naked eye.

More than a simple wiping of the glass is needed so that you can "see your way clear." Most road grime and other deposits will yield to a washing with clean water and a mild detergent. But with stubborn dirt or "haze" that won't wash away easily, you might try the original formula "Bon Ami," a non-scratching cleanser available in powder or cake form.

COMMENT: Once before I had written to you about my car and you gave me important information. I need your advice one more time. I own a 1974 six cylinder automatic. She has 161,000 miles and runs good. My problem is that when the car idles in drive it is somewhat rough. When I am driving and come to a light to stop she idles shakey. When I take it out of drive to park or neutral, she idles OK. Can you please tell me why she does this? In other words she drives good, she takes off good, she idles slightly rough in drive while standing still.

REPLY: Basically, your idle speed is too low.

When tuning an engine it's critical to follow the manufacturer's specifications exactly. These specifications include a set-up.

For your car, engine and transmission, the set-up reads: With engine at normal operating temperature, choke open, fuel tank line to vapor canister disconnected, distributor vacuum hose disconnected and plugged, air conditioning off, transmission in "D" and idle speed solenoid energized, adjust solenoid (turn complete body) to obtain Solenoid Energized RPM. De-energize solenoid and use Allen head screw (in end of solenoid) to obtain Solenoid De-Energized RPM. The respective RPM's are 600 and 450 for your vehicle.

If that doesn't solve the problem, move on to your basic timing which for your car should be six degrees before top dead center (BTDC) "with the transmission in 'D', air conditioning off and distributor vacuum line disconnected and plugged." Again, you have to follow the instructions exactly to get the proper results.

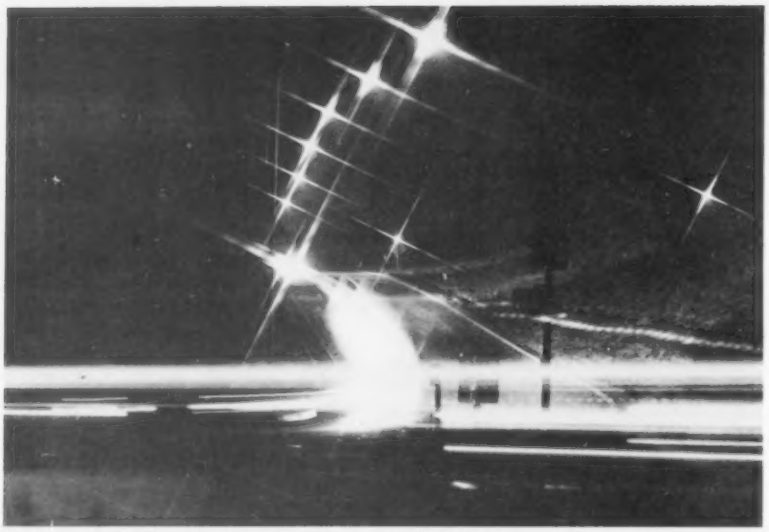
From here you will have to track a myriad of problems that might be contributing to the rough idle problems. Because it would take an entire book to detail these problems and the corrections, I'll just list the possibilities and advise you to get a good workshop manual to help with the repairs.

Other possible causes of rough idling include: improper idle mixture adjustment, improper feedback system operation, improper spark plug gap, moisture in ignition components, loose or broken ignition wires, damaged distributor cap or rotor, faulty ignition coil, fuel filter clogged or worn, damaged idle mixture screw, improper fast idle cam adjustment, improper EGR valve operation, faulty positive crankcase ventilation (PCV) valve air flow, choke binding, improper choke setting, vacuum leak, improper float bowl fuel level, clogged air bleed or idle passages, clogged or worn air cleaner, faulty choke vacuum diaphragm, exhaust manifold heat valve inoperative, improper distributor spark advance, leaking valves or valve components, improper carburetor mounting, excessive play in distributor shaft, and loose or corroded wiring connections.

EDITOR'S NOTE: If you have a general interest automotive question that you would like answered, and feel others could use the knowledge too, send it to:

Double Tech
DRIVER Magazine
HQ AFISC/SEDD
Norton AFB, CA 92409

dimming glare



Driving at night requires better vision and more caution than daytime driving.

Don't look directly into oncoming headlights, especially when they're on bright. Once blinded by these it will take a full seven seconds to get your night vision back, and sometimes longer.

This time of year the sun goes down earlier and comes up later, therefore we're all driving at night more. And if you didn't already know it, driving at night calls for better vision and more caution than daytime motoring.

You simply cannot see as well at night as you can in the daytime. At night it is difficult to judge distances, color perception is severely curtailed, and it is difficult to distinguish shapes and sizes.

Distance-judging vision involves three eye functions. The first is two eyes working in unison. The second is moving "parallax," where moving the head from side to side makes distant objects appear stationary while close objects seem to move. The final function for judging distance is comparing relative sizes; however, in the dark there's nothing to compare sizes with.

Another big night vision problem is that lights, especially red lights, appear to be farther away than they really are.

At night, you can receive help from your peripheral vision. Peripheral vision is side vision — seeing things "out of the corner of your eyes." Peripheral vision is sensitive to light, movement and anything that's lighter or darker than the background.

If you constantly move your eyes from point to point you will exercise your peripheral vision. Because your side vision is more sensitive to dimly lit objects, this movement of the eyes will help you see better at night.

Moving your eyes from side-to-side also brings larger areas into clear focus, bringing out details that may have been hidden in the eye's blind spot. Because peripheral vision detects only motion and since the faster you go the narrower the peripheral vision becomes, scanning to get as many details as possible clear enough for inspection is doubly important at night when things are semi-hidden in the dark.

Yet another *light* problem occurs when meeting that occasional vehicle going in the opposite direction. There are times when you notice how light-sensitive your eyes are, but seldom do you realize how really long it takes to recover from such encounters. You become aware of your eyes' light sensitivity when you're popped in the eyes by a photo flash, or when you rush headlong from bright sunlight into a dark tunnel. You go temporarily blind.

The same thing happens when you stare into oncoming lights at night: Temporary blindness.

When looking directly into oncoming headlights it takes a full second for the pupil to respond to the increased light. In that second rhodopsin, the chemical that helps you see in low light, is drained from the eye.

Once the headlights have passed, the chemical process reverses and the light-seeking chemistry slowly is restored to the retina. But this gradual regeneration takes an average of seven seconds. Of course this time can be more or less than seven seconds depending on how bright the oncoming headlights are and how long you looked into them, and also how old you are.

One minute after the intense light stops, the eye's sensitivity to a low level increases tenfold. And in 20 minutes this sensitivity increases 6,000 times.

It helps, of course, if you don't stare directly into the lights in the first place. Try focusing just to the side of the lights or following the edge of the road with your eyes instead. Keep your eyes moving to avoid the spots in front of your eyes. Allow your peripheral vision to keep you informed.

If you do meet a car that doesn't dim its lights you may have to put up with it.

If the other car isn't too close, flash your own lights to bright and then quickly back to low beam. This may be all the reminder that's needed to get the other driver to dim his or her bright lights. If, however, the other driver doesn't switch to low beams, shrug it off and look away. There's nothing to be gained by both of you being blinded by highbeams.

Once again, protect your eyes against the bright light. When you are driving through a brightly lit commercial area of the city, avoid looking at the lights.

Also, dim the lights on your dash enough so you can still read the dials, but so they don't detract from your sight.

If you know you're going driving at night, seek a darker environment to allow your eyes to adapt before driving. Also wear sunglasses during rest breaks at brightly lit service stations, rest areas, coffee shops or restaurants. This minimizes the amount of adjusting your eyes will have to do when back on the road. However, *never* wear sunglasses when you're driving at night.

Also, make sure all the glass in the car is clean. This includes not only the windshield and mirrors but also the *inside* of the glass. Don't forget to keep your eyeglasses clean, if you wear them.

Tests have indicated that the driver's night vision is severely impaired by windshield surfaces that have been worn down over time. This wear is called haze. It's also been shown that drivers normally slow down at twilight or when some other factors affect their visual performance. But this reduction of driving speed didn't occur during tests with windshields suffering increased haze. Obviously the test drivers didn't perceive the impairment of their visual performance with haze, but you should.*

Alcohol can also be a problem at night when combined with fatigue, lighting changes and bad glare. Alcohol:

- Slows reaction time,
- diminishes coordination, and
- contributes to overconfidence.

Alcohol also relaxes eye muscles, slowing their responses. This means that you take longer to focus and even have trouble holding your eyes on an object so that you can focus on it. Without being able to control your eyes, you're going to start getting inconsistent visual signals, experience double-vision, lose your balance, and lack depth perception.

The older your car's windshield the more likely haze will interfere with your night vision. You should adjust your speed down until you can afford to replace the old glass with new.

Smoking is also a night driving problem since ingesting all that carbon monoxide and nicotine interferes with the delivery of oxygen. And the eye photochemistry needs oxygen. Without it, the chemical reaction takes longer, making recovery from glare a slower process.

Let's continue with a little more information about headlights. The beam pattern produced by low-beam headlamps is the result of a compromise that takes several variables into consideration. However, the dominant reasons for having headlamps is to provide sufficient forward visibility, and it is apparent that today's headlamps are deficient in that respect at anything other than low to moderate speeds.

Barring the acceptance of polarization or the development of an equivalent system, the only way of improving visibility is by increasing output. One of the major barriers to this approach has been consideration of discomfort arising from glare. The data presented during the 1984 Society of Automotive Engineers headlamp glare sessions was encouraging in that they suggest: (1) judgments of glare discomfort depends on context to a significant degree, and (2) people may be more tolerant of glare than previously supposed.

The history of automotive lighting reveals many ingenious attempts to reduce glare while providing adequate illumination for seeing. In theory, many of these have been excellent systems. However, headlamps have to be designed for best possible functioning under real-world conditions. Thus engineers agree headlighting research should take two steps: (1) An agreement on the factors to be considered in the evaluation, and their relative weighting, and (2) research to develop the best possible data for each factor.**

Considerable progress in the direction indicated has been made by people at Ford in the development of the Comprehensive Headlamp Environment System Simulation (CHESS) model. This model provides a much broader, more comprehensive and more economical computerized method of measuring headlighting performance than the traditional seeing distance field tests. The model was developed from an extensive program including nighttime field tests, traffic surveys and analysis and application of earlier research work.

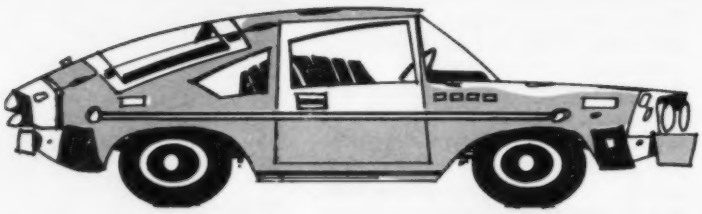
Some areas for further research and for enhancement of CHESS include: (a) quantification of discomfort glare effects on driving performance, (b) determination of driver performance as a function of visibility of either left or right or both lane delineation lines, (c) assessment of foreground illumination effect on driver performance, (d) development of methods to incorporate effects of fog and rain, (e) expansion of data base to incorporate a larger, more representative standardized test route, and (f) reprogramming CHESS to effect substantial reductions in the cost of running the program, thereby making it a more practical tool for optimizing beam patterns.***

**SAE Technical Paper Series 840395, The Influence of Scattered Light in Windshields On Driver's Vision During Night Driving by Klaus Rompe and Gunter Engel, TUV Rheinland e. V. Institute for Traffic Safety Cologne, FRG.*

***SAE Technical Paper Series 840047, Glare and Headlighting Design by Paul L. Olsen and Michael Sivak, The University of Michigan Transportation Institute.*

****SAE Technical Paper Series 840046, CHESS Model Applications in Headlamp Systems Evaluation by V.D. Bhise, C.C. Matle and D.H. Hoffmeister, Ford Motor Company.*

10 MORE CRASH TESTS



The National Highway Traffic Safety Administration completed its New Car Assessment Program for 1984 with the release of results of 10 motor vehicle crash tests. Results of the previous 28 vehicle crash tests were in the July and August issues of DRIVER.

All the vehicles were crashed at 35 mph into a fixed barrier, in frontal tests designed to indicate relative levels of occupant protection and vehicle safety performance. This is 5 mph faster than the prescribed speed for compliance with federal motor vehicle safety standards.

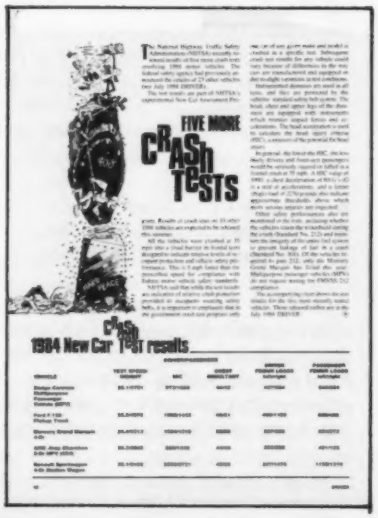
The test results are indicative of relative crash protection provided to occupants wearing safety belts. It's important to emphasize, however, that in the government's crash test program, only one car of any given make and model is crashed in a specific test. Subsequent crash test results for any vehicle could vary because of differences in the way cars are manufactured and equipped or due to slight variations in test conditions.

Instrumented dummies are used in all tests, and they are protected by the vehicles' standard safety belt system. The head, chest and upper legs of the dummies are equipped with instruments which monitor impact forces and accelerations. The head acceleration is used to calculate the head injury criterion (HIC), a measure of the potential for head injury.

In general, the lower the HIC, the less likely drivers and front-seat passengers would be seriously injured or killed in a frontal crash at 35 mph. An HIC value of 1000, a chest deceleration of 60 G's (G is a unit of acceleration) and a femur (thigh) load of 2250 pounds indicate approximate thresholds above which more serious injuries could occur.

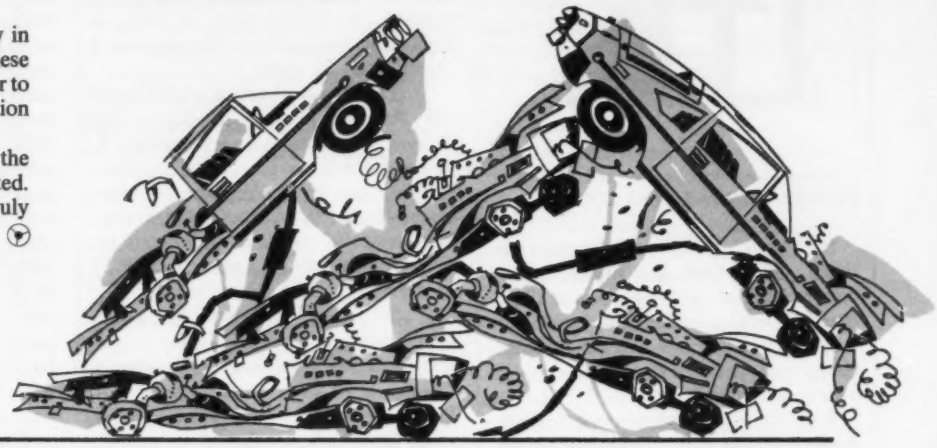
Other safety performances also are monitored in the test, including whether the vehicles retain the windshield during the crash (Standard No. 212), and maintain the integrity of the entire fuel system to prevent leakage of fuel in a crash (Standard No. 301). Of the latest 10 vehicles crash-tested, only the Ford Mustang two-door convertible failed the 212 standard. All the tested vehicles passed Standard 301.

The experimental New Car Assessment Program began in 1979. The program is intended to provide a relative comparison of the crashworthiness and safety performance built into new production vehicles. The agency is continuing to examine several aspects of



the program such as the variability in test results, and the relationship of these tests to real world accidents, in order to improve crashworthiness information provided to consumers.

The accompanying chart shows the results for the last 10 vehicles tested. Results for the first 28 are in the July and August issues.



CRASH TEST results

VEHICLE	Test Speed Vehicle Weight	HIC Driver/ Passenger	Chest Resultant Driver/ Passenger	Femur Loads Driver left/right	Femur Loads Passenger left/right
Datsun 200SX 2-dr HT	34.7 / 2880	1992 / 582	44 / 32	510 / 1070	460 / 20
Mercedes/Benz 300SD 4-dr Sedan	34.7 / 4270	890 / 734	63 / 44	1150 / 1410	490 / 295
Toyota Van Wagon MPV	35.4 / 3616	984 / 748	50 / 54	2450 / 2263	1011 / 615
Buick Park Avenue 4-dr (1985 model)	34.9 / 3850	1550 / 662	50 / 37	1145 / 820	710 / 400
Ford Mustang 2-dr Convertible	34.8 / 3560	894 / 1112	55 / 38	830 / 1180	960 / 1400
Honda Prelude 2-dr Coupe	34.7 / 2780	659 / 475	43 / 31	600 / 510	690 / 980
Isuzu Impulse 2-dr Hatchback	34.6 / 3230	1769 / 2454	46 / 49	850 / 1530	470 / ND
Mitsubishi Tredia 4-dr	34.7 / 2740	1314 / 1521	87 / 57	1475 / 350	610 / 450
Renault Alliance 4-dr	34.8 / 2460	940 / ND	55 / 42	315 / 445	1550 / 225
Toyota Tercel 4-dr Hatchback	35.1 / 2440	658 / 492	43 / 41	245 / 370	200 / 160

VW DRIVER DESERVES CITATION

If I were a highway patrolman on the scene, the Volkswagen in the center picture on page six in the August 1984 issue of DRIVER Magazine would get a fat, juicy citation for illegal passing. He (or she) is in the process of driving over a double yellow line.

Regardless of whether or not the slow moving vehicle driver signals for you to pass, you may not cross the double yellow line.

Keep up the good work. Your magazine is excellent and a useful tool in my safety program.

John A. Herschkorn, Jr.
San Jose, CA 95150

Your decision to issue a citation is just a little bit premature according to a local highway patrol lieutenant. He points out that the double yellow line could be for the intersection the traffic has just passed through, in which case the no passing zone ends just about where the small car is passing the tractor. As the arresting officer you would have to wait to see if the line under the car is actually double yellow before initiating a stop. Actually, he knows the exact location of the pass and you're right, the small car is starting to cross a double yellow line which doesn't end until the island you can see between the VW and the tractor where the road becomes a divided four-lane highway.

The lieutenant did note that if the tractor operator had waved the car driver by and there had been an accident, the tractor operator would be ticketed for contributory negligence. So, be cautious passing even when signaled it's OK.

MOTORCYCLE PASSENGERS

Really enjoyed your article "There is NO SUCH THING as a motorcycle PASSENGER" in the May 1984 issue of DRIVER. It has a lot of useful information in it; however, some parts of it were a little amateurish and out of context. In the interest of keeping DRIVER true-to-form and correct, I submit the following:

1. The title is incorrect according to the Random House College Dictionary, which states a passenger is: "1. A person who is carried in an automobile, bus, train, airplane or other conveyance." 2. A wayfarer; traveler. The word "in" is "used to indicate inclusion within space, a place, or limits" as defined by the same reference.

2. On page 13, when talking about accelerating, it is stated: "Loss of steering from load shifting or, worse, a wheelie is no fun." If the motorcycle driver is experienced enough to carry a passenger, he is, or should be, experienced enough to not allow "loss of steering from load shifting or, worse, a wheelie." An occurrence of this type can only be construed as reckless or imprudent operation of a motor vehicle.

3. On page 12, the pictures of "accelerating" and "stopping or braking" are slightly over exaggerated. If the passenger has to lean forward or backward that far, the motorcycle operator is evidently exhibiting poor motor vehicle operation habits (i.e. jackrabbit starts and stops . . .).

For real guys — DRIVER is a fine magazine and I hate to see things like this detract from the main theme and credibility of this otherwise great article. Motorcycle safety cannot be overemphasized.

AT1 Gerald Merry, USN
Pax River, MD 20670

The article's title had to do with the fact that the second rider on a motorcycle is not just along for the ride but is an active participant in the vehicle's control; or as the first sentence said, ". . . but never just passengers." Your reference to experienced motorcyclists and carrying passengers is true, but many inexperienced motorcyclists do give others rides — rides that have often included wheelies and loss of control. You are right about the pictures being exaggerated. Sometimes that is necessary to adequately illustrate the point.

COUNTERSTEERING KNOWLEDGE

I just finished reading your September motorcycle article titled Countersteering. On page 19 the affects of braking and acceleration during a turn were briefly mentioned. But not in sufficient detail. Yes, the lean angle will increase when using both brakes in a turn! But if only the front brake is applied the bike will tend to stand up and widen the turn line. If only the rear brake is applied the lean angle will increase and tighten the turn line. In fact this will have a greater affect than using both brakes. This is an old road racing trick used for changing lines quickly after entering a turn to avoid another bike or debris on the track. At moderate to high speeds the results can be quite dramatic with very light brake applications.

If you ever find yourself set up wrong to safely finish a turn, or facing a car on your side of the white line, this bit of knowledge could save your life.

SSgt. Alan B. Robbins, USAF
Charleston AFB, SC 29404

We'll have to say a very big "maybe" to your braking-in-the-turn techniques, and only if you have the motorcycle riding skills of World Champion Kenny Roberts, Freddie Spencer or Eddie Lawson. The Motorcycle Safety Foundation does teach using both brakes in a turn to straighten the machine up. In fact, if you don't put additional steering input into the fork when you use both brakes in a turn you will straighten up. Using the front brake in a turn while countersteering is almost a sure thing for a sudden fall, not straightening up. And all that we could find out from any of our road racing friends about using the rear brake was a technique applied with opening the throttle for getting more horsepower to the road at the exit of a turn. Your tricks might

work, but probably only for the most skilled, experienced riders. And even then, only during closed circuit racing when going down at speed means a slide across the track and into the hay bales, guard rails or other hazards instead of under the wheels of a four- to eighteen-wheeler.

MORE TIPS ON OVERHEATING

While reading your *Timely Topics* section, I remembered an overheating engine problem we had while enroute to inspect an Air Force detachment in a not-too-friendly foreign country. With a van-load of uniformed officers on a hot and dusty remote stretch of road we noticed the engine was overheating. Everyone seemed surprised when I turned on the van's heater. With the ambient temperature at 90-plus it got darned stuffy inside that van, but guess what — we continued our trip because the engine temperature fell into the normal range. I'm not a mechanic, but it seems to be widely known that dissipating heat from the engine occurs when the car's heater is operating. This is particularly useful in the mountains and can prevent loss of coolant due to boil-over from an otherwise intact cooling system. And even if a coolant leak has developed, it can possibly keep you going until reaching a service station.

Maj. Richard S. Baldwin, USAF
Tinker AFB, OK 73145

PARENTS SHOULD BE TICKETED

In the September 1984 issue of DRIVER on page six was an article titled: A Tale of a Senseless Tragedy. After reading this article a thought came to mind that I've become acutely aware of since my first encounter with living in a base housing area.

The thought is this; why don't parents control their children? The article was tragic, I agree, but it points to the fact that a 16-month-old child was allowed to play around cars unobserved. However, the driver was made to suffer and some fault laid on him. I contend that any parent who allows children to play around parked cars or in the street are to blame. In my earlier years in the Air Force I was a Security Patrolman. Part of my duties was patrolling the housing area. I can't count the times I had to chase children (parents nowhere in sight) out of the street. And now just living on base and driving back and forth to work I encounter children who think the street is their playground. If a driver, no matter how careful he or she might be, hits one of these children the driver has to suffer. I sincerely believe that children found playing in the street should be taken to their parents and a ticket issued.

I feel for parents who lose their children senselessly; however, along with the joy and pleasure of having children comes the responsibility of caring for and controlling that child.

Yes drivers, it is up to us to watch out for the "little people," but parents, the responsibility is yours and mine to make sure our children are taught not to play around parked cars or in the street, and that they are observed at all times.

MSgt. R.L. Bemis, USAF
K.I. Sawyer AFB, MI 49843

SMALL PRICE TO PAY

I read your magazine regularly and find it very helpful. Recently I read the sad report of a car backing over a child and killing her.

It is my theory that many an accident is caused by carelessness, the absence of care. I have developed a habit which takes only a few seconds of my time, but which is well worth the extra effort to know I won't have an "accident." I'll pass it on in the hope that you and your readers might find it useful.

Whenever I approach my car, I make sure to walk around the back of it. Even if I come from the front, I make one full circuit of the car. That way I can be sure I will never "accidentally" back over something or someone behind me, below my line of vision. I think it's a small price to pay to prevent taking a life.

Micki Ross Adams
Yellow Springs, OH 45387

BETTER THEN THAN LATER

I'm an Army journalist and I have been reading your publication for several years now.

I am a firm believer in wearing seat belts. However, not many people who are passengers in my car are. When they refuse to buckle their seat belts in *my* car, I tell them a story I read in your magazine from a young airman several months back.

This airman was returning from a trip to his parent's home someplace in the Southwest. He had taken his fiance along to introduce her to the family. She was the driver that night on that lonely, dark road heading back home.

Somehow she lost control of the car and it went off the road, flipped over and landed upright. Because he was strapped in, he was not injured. He looked over to the driver's side and noticed the empty seat and the smashed windshield. He unbuckled, ran out and found her a few feet away.

He gave her mouth to mouth but realized he only heard gurgling sounds instead of breathing caused by her blood-filled lungs. She was dead.

He sat there rocking her in his arms and cried. The police and ambulance arrived what seemed hours later. Medics told him she died on impact with the windshield and never had a chance. The airman later recounted in the story that the worst part of the tragedy was not burying his fiance, but explaining to her family why she died and he didn't.

His answer — "I was wearing my seat belt, she wasn't."

She left a small daughter.

I can't help but cry when I recount this story. And I have, many times.

My passengers silently and solemnly buckle up. Those who don't have another choice. I get out, open their door and say "good-bye."

Better then than later, standing over an open casket.

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Are YOU Concentrating ON YOUR DRIVING?

Be on the defensive against these seven concentration destroyers:

- **Alcohol and other drugs**
- **Daydreaming**
- **Distractions**
- **Fatigue**
- **Anger**
- **Frustration (like in slow-moving traffic)**
- **Stress**

Are YOU Concentrating ON YOUR RIDING?